



Operations and Maintenance Procedures

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O&M Section # 12.3	SCUD Task # 110
Section: Construction/Operations	Revision Date: 09/06/16

Joining of Plastic Pipe – Butt Heat Fusion: Hydraulic Machine

SCOPE AND PURPOSE

This procedure is to provide personnel with safe and effective activities to produce strong gastight joints utilizing butt heat fusion techniques.

It describes practices required to comply with §192.281(a) and (c)(1)-(c)(4).

RESPONSIBILITY

The Main Line Supervisor, Service Line Supervisor, Maintenance Supervisor, or other designee, is responsible to ensure that joining plastic pipe by butt heat fusion is performed as described in this procedure.

PERSONNEL SAFETY

Every reasonable precaution shall be taken to protect employees and the general public.
Avoid using fusion machine in a combustible gas atmosphere.

EQUIPMENT AND MATERIALS

Butt Fusion Machine
Facing Unit
Heating Tool
Electrical Power Source
Other Equipment and Materials as Needed

OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by an individual who is currently qualified to perform this task. Refer to the OQ Plan for specific qualification requirements.

INSTRUCTIONS

Maintenance and Operation of Equipment

All equipment shall be operated and maintained in accordance with the manufacturers' instructions.
The manufacturers' instructions shall take precedence if a conflict appears with these instructions.

General

- Manufacturers may have a similar but slightly different approach regarding plastic pipe heat fusion; however, pipe melt patterns must be joined with a specified amount of force and maintained in an immobile position until adequately cooled as described in the manufacturer's instruction manual. Personnel performing butt heat fusion production joints shall follow each respective joining procedure.
- Coated butt fusion heater plates should be attached to heating tool. The heater plate surfaces are coated with an anti-stick coating and must be clean and free of any contamination.

Hydraulic Machine Steps

- a. Make sure the hydraulic power unit is in the off position.
- b. Connect hydraulic hoses from the hydraulic power unit to the facer and carriage.

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- c. Perform general maintenance check ensuring:
 - * Proper oil level
 - * Hoses and electrical cords are in good condition
 - * Correct input voltage to fusion machine
- d. Connect fusion machine to proper power source and turn on hydraulic pump motor.
 - * Note gauge pressure and if necessary, set system pressure according to manufacturer's recommendations for pipe size & SDR.
- e. Prepare heater by attaching butt fusion heater adapters to the heater tool. Place heater into an insulated heater stand and connect to proper power source. Allow heater to warm up and reach operating temperature. (400-450 degrees)
- f. Install proper inserts into pipe clamps for the pipe size to be fused.
- g. Position pipe into fusion machine. The pipe ends should extend slightly beyond the clamps. Ensure sufficient material will be removed for a complete facing.
- h. Close clamps and rotate clamp knobs until pipe is securely tighten in place.
- i. Thoroughly clean pipe ends removing dirt and other debris.
- j. Place facing unit between the pipe ends onto the guide rods and lock into position.
- k. Assure the selector valve handle is in the facing position. Move the carriage toward the fixed clamps. Face pipe ends producing continuous shavings. Continue operating facer until facer stops have bottomed out against the clamps.
- l. Once facing is completed, turn off facing unit, separate pipe ends and remove facer by unlatching from guide rods.
- m. Remove shavings being careful not to touch the newly faced pipe ends.
 - * Inspect pipe ends for complete facing.
- n. Move the carriage to bring the pipe ends together again and check for proper alignment. If necessary, adjust high side down by tightening clamp. Once the pipe is properly aligned, move the carriage to separate pipe.
- o. Once heating tool has reached acceptable surface temperature, position between pipe ends. Shift the selector valve handle in the fusing position. Move the carriage bringing the heater and pipe ends together. Once the pipe ends are firmly against the heater, if applicable, immediately move the selector valve to the neutral position. This will remove any unnecessary pressure. If too much pressure of the pipe against the heater is maintained during the heating period, melt will be squeezed away from the pipe ends. This could cause a weakened joint after fusing. Heat the pipe ends until melt swell beads have reached the proper size.
- p. Shift the selector valve handle to the fusion position. Move the carriage just enough to remove the heater then quickly move the carriage again bringing the pipe ends together. The force applied will cause the melt swell beads to roll back onto the pipe creating a double bead. Allow the joint to cool under pressure according to the pipe manufacturer's guidelines.
- q. Once the pipe has sufficiently cooled, shift the carriage control valve to the neutral position and remove fused pipe from fusion machine.
 - * Visually examine the joint for compliance.

REPORTING/NOTIFICATION

Complete documentation in accordance with Operation and Maintenance Manual.

RELATED PROCEDURES

CONST009 – Joining of Plastic Pipe - Butt Fusion – Manual